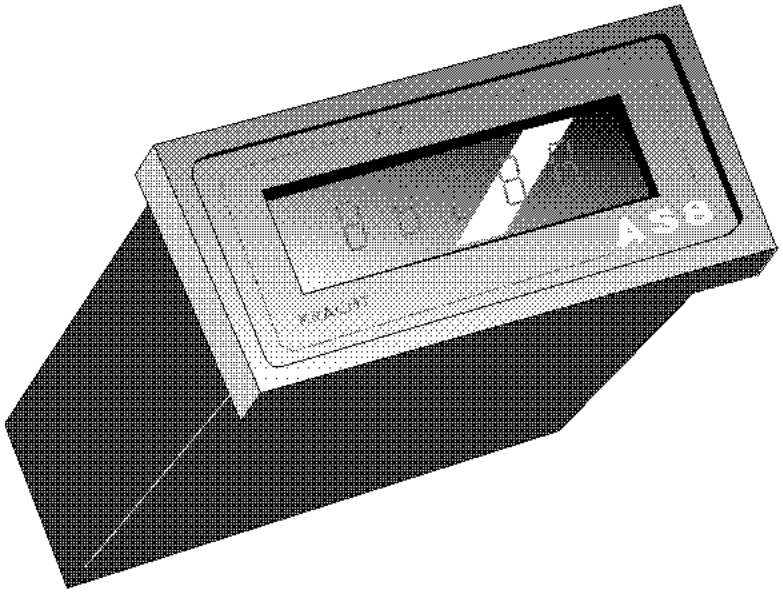
A S 8
O p e r a t i n g I n s t r u c t i o n s



KRACHT

Volutronic ®

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1. Safety

The safety notes included in these operating instructions are indicated by this ‘attention-getter’ symbol.
If the text accompanying this symbol is not heeded, danger to personnel or equipment may result.

Other instructions, which are not safety warnings, but which give advice on optimum operation, are indicated by a hand.

General safety instructions

The electronic AS8 is constructed to the latest standards in technology. The AS8 should be operated only
- in technically sound condition,
- as instructed,
- with awareness of the safety precautions, following these operating instructions.

The AS8 must only be operated as an item of equipment installed in an internal area.

The AS8 must only be operated in the prescribed condition.
The stated limiting values (see also section on “Technical Data“) must, under no circumstances, be exceeded.

Personnel engaged in the installation, operation and maintenance of the AS8 must be appropriately qualified. This qualification can be obtained by appropriate training or instruction. Such personnel must be familiar with the contents of these operating instructions.

During all operations the relevant national regulations relating to safety precautions in the work place and where applicable, internal regulations of the operator must be observed, even if these are not detailed in these operating instructions.

The AS8 must not be operated in hazardous areas, nor in areas where medical apparatus is in use, nor in areas which are expressly named in VDE 0411 Part 100.

If the AS8 is used for the control of machines or sequential processes where damage to the machine or accident to operating personnel is possible as a consequence of failure or faulty operation of the AS8, then appropriate safety precautions must be implemented.

In the case of variations (including those relating to operating behaviour), which prejudice safety, the AS8 must be switched off immediately.

During installation work on the AS8, the power supply must always be disconnected. Installation work must only be carried out by appropriately qualified personnel.

2. Description

Measuring equipment devices in the AS8 series are four segment indicator units for flow rate and volumetric measurement.

The units are usually operated in conjunction with KRACHT volume counters. However, other measuring systems with incremental signals can be connected. These may, for example, be oval wheel meters or angle of rotation sensors.

The incremental input signals are filtered, converted and translated by the micro controller into the physical quantities of flow rate and volume.

Two relays, an analogue output or an RS232 serial interface, are available for additional external processing.

Programming and adjustment is achieved by means of three keys which are accessible on removal of the front cover.

The integrated 24 V DC sensor supply enables direct connection to the volume counter.

The measuring devices in the AS8 series are obtainable as built-in control panel devices, as desk-top units, or as 19“ rack-mounted units.

The variety of characteristics and alternatives available make this compact unit always the first choice, particularly from the viewpoint of cost saving and when there is a special requirement to determine flow rate and volume.

Manufacturers address:

KRACHT GmbH
Gewerbestraße 20
58791 Werdohl

Tel. 02392 / 935-0
Fax 02392 / 935209

3. Connecting the AS8

This section deals with the layout of the connections on the AS8. The electrical connections are made on a screw terminal strip.

The connection layout for the desk-top unit and the 19” rack-mounted unit versions are covered in sections 10 and 11.

3.1 Connecting the voltage supply

The AS8 is operated with an alternating voltage of 230 V / 115 V AC or direct voltage 12 / 24V DC. Please specify the kind of power supply when ordering. The exact type can be found in chapter **6.Type code**.

The connections for alternating-current voltage 120 / 230V AC :

L	Terminal 1
N	Terminal 2
PE	Terminal 3

The connections for direct voltage 12 / 24V DC :

+	Terminal 1
GND	Terminal 2
PE	Terminal 3

Fire prevention: The unit should be protected by an external fuse on the supply side. In accordance with VDE 0411, in the event of failure, 8A / 150 VA must not be exceeded. The recommended external fusing is 100 mA at a supply voltage of 115 and 230 Volt.

3.2 Connecting the volume counter

The ASR16 is preferably operated in conjunction with KRACHT volume counters. However, other measuring systems with incremental signals can be connected. These can be, for example, oval wheel meters or angle of rotation sensors.

<u>Sensor supply</u>

The sensor supply is not short circuit proof.

The sensor supply is connected to connections 8 and 9. However, the sensor supply must not be used for the supply of unearthed inductances or capacitive loads.

	Voltage	Ripple	Maximum permissible current
Terminal 8	+24 VDC +/- 20 %	load dependent	50 mA
Terminal 9	0 V		

Signal inputs

Measuring systems with incremental signals provide two square wave pulses. The square wave pulses are displaced from one another by 90°. It is therefore possible to detect the direction. This is referred to as a two channel layout.

If a measuring system with one square wave output is available, it is referred to as a single channel layout. In this case direction detection is not available.

Single channel or two channel connection must be set on the AS8. The settings required are made under menu reference „**08**“ at the **“meter input”** position (see **4.1 overview of the input values**).

Connection of the signal inputs is made on terminals 10 and 11. Connection terminal 11 is not used on the single channel layout.

	Channel 1	Channel 2

Counting input	Terminal 10	Terminal 11

The measurement parameters of flow rate and volume are derived from the square wave signals.

The terms volume measurement and flow rate measurement are often interchanged, however, they are two completely different measurement parameters.

The indicator, the relay and the analogue output can be switched between flow rate measurement and volume measurement, as desired. This is achieved in the programming of the AS8 under the menü reference „**7**“. A „**0**“ is set for flow rate measurement and a „**1**“ for volume measurement (see **4.1 Overview of the input values**).

3.2.1 How is the flow rate measurement activated ?

As soon as a medium flows through the volume counter a flow rate indication appears. No special action is required. The instantaneous flow rate is indicated, as a rule in litres per minute.

The AS8 must be adjusted to the actual volume counter that is connected. The procedure is given in **section 4.2 What must be programmed when connecting a volume counter?**

3.2.2 How is the volume measurement activated ?

By volumetric measurement is implied the summation of the amount of a medium which has flowed through a volume counter. As a rule the indication is in litres.

The summation commences when the summation enable is switched.

The enable input is connected to **terminal 12**.

If there is a voltage of 24 V at the enable input, summation of the volume commences. The measured values on the display change.

If there is a voltage of 0 V at the enable input, summation of the volume is stopped. The measured values on the display do not change.

When the voltage at the enable input is changed from 0 V to 24 V the summation is reset to zero. The determination of the volume starts again.

The AS8 must be set for the particular volume counter that is connected The procedure is given in **section 4.2 What must be programmed when connecting a volume counter?**

3.3 Connecting the relay contacts

The AS8 has two relay contacts. The relays are designed as potential-free contacts. That is to say, the user must input the potential at the base terminal.

The relays are provided with normally-open contacts. The switching voltage is 24 V, maximum switching current is 1A. Voltages greater than 48 V must not be switched on any account.

Relay	Contact (Signal)	Common terminal (Base)
K0	Terminal 5	Terminal 7
K1	Terminal 6	Terminal 7

How do the relays operate ?

The function of the relays can be set as required, i.e. each relay can be allocated to the flow rate or volume measurement parameters.

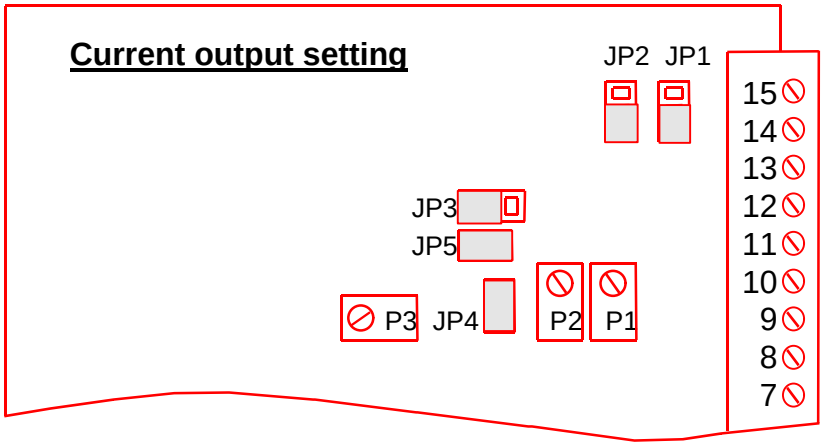
The relays can be set as required to flow rate measurement or volume measurement. Thhis is achieved in the programming of the AS8 under the menu reference „**7**“ at the „**Relais 1**“ or „**Relais 2**“ position. A „**0**“ sets the flow rate position, a „**1**“ sets the volume measurement (see **4.1 Overview of the input values**).

An on and an off switching value can be programmed for each relay. The relay switches when the switch-on value is exceeded. When the switch-off value is undershot, the relay drops out again. The relays can be programmed as normally-open or normally-closed.

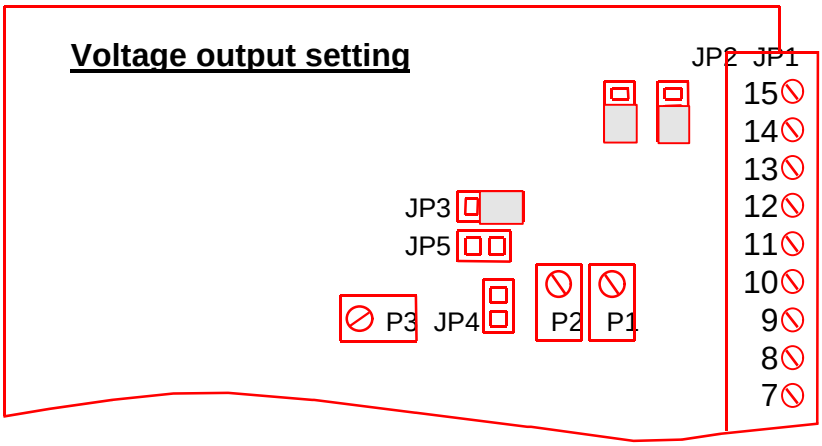
The programming of the switch-on and switch-off values is given in **section 4.5 What must be programmed when connecting the relay outputs?**.

3.4 Connecting the analogue outputs

The AS8 operates via an analogue output or a serial interface. The appropriate adjustment is achieved within the device, by means of jumpers. The jumper settings for current output and voltage output are shown in the accompanying figures.



The strength can be set on P1 and the offset on P2.



The strength can be set on P3 and the offset on P2.

In accordance with the software, the settings +/-10 Volt, 0-10 Volt and 2-10 Volt and +/-20 mA, 0-20 mA and 4-20 mA are available for signal selection. The selection is carried out by programming the AS8 under menu reference "**8**" at the "**Analogue output**" position. The functions are set using "**0**" or "**1**" (see **4.1 Overview of the input values**).

	PLUS	Minus

Analogue output	Terminal 14	Terminal 15

How does the analogue output function ?

The function of the analogue output can be freely selected, i.e. it can be assigned to the measurement parameters of flow rate or volume.

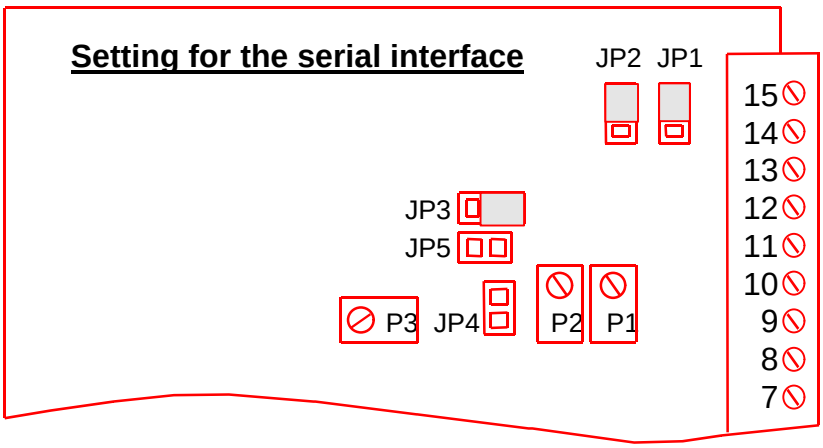
The display, the relay and the analogue output can be switched to flow rate measurement or volume measurement , as required. This selection takes place when programming the AS8 under menu reference **“7”** at the **“analogue output” position.** A **“0”** sets flow rate measurement and a **“1”** sets volume measurement (see **4.1 Overview of the input values**).

A maximum value can be programmed for the analogue output. The maximum value corresponds to an output of 10 V and 20 mA.

The details of programming the maximum value are given in **section 4.6 What must be programmed when connecting the analogue output ?**

3.5 Connecting the printer

The AS8 makes use of a serial interface having an RS232 layout. The choice between analogue output or serial interface is made by means of a jumper inside the unit.



The RS232 has the fixed setting: 9600 baud, 8 bit, No parity, XON, XOFF. There is no hardware handshake.

	Transmit data TXD	Receive data RXD	Functional earth GND

RS 232	Terminal 14	Terminal 15	Terminal 9

The interface can be operated as a printer interface and for “parameterising” the AS8. There is no switch-over between the operating modes.
In the **printer interface** operating mode, the selected data is output as ASCII characters via the serial interface.
The instantaneously displayed value is printed out each second, followed by a CR LF.
Example:

Displated value	Printout	ASCII String
3.500	+ 3.500	2 B 33 2E 35 30 30 0D 0A

3.5.1 Which data can be printed out ?

The currently displayed value is printed out.

3.5.2 How is the data printed out ?

A printout is triggered via a digital input. The values are transferred to the serial interface in a per second sequence.

The printer drive is switched-on on the application of a voltage of 24 V at the enable input (terminal 13).

3.6 Parameterising via the serial interface

A PC or a PLC is connected to the AS8 via the serial interface.

The PC or PLC can change specific AS8 parameters by means of an ASCII character string.

The unit distinguishes between the different values through an identifying letter. No protocol is used.

The character string is received complete as an ASCII string and converted on acceptance. ASCII strings can only be received one after the other. If a faulty string is received, an ERROR string is sent.

Example:

Identifying letter	Input value	String	ASCII STRING
A	Pulse size volume counter	A0.040	41 30 2E 30 34 30
B	Max.value analogue output	B3.500	42 33 2E 35 30 30
C	Damping - digital filter	C9999.	43 39 39 39 39 2E
D	'Pull-in' value Relay 1	D0.000	44 30 2E 30 30 30
E	'Drop-out' value Relay 1	E1.000	45 31 2E 30 30 30
F	'Pull-in' value Relay 2	F1.500	46 31 2E 35 30 30
G	'Drop-out' value Relay 2	G3.000	47 33 2E 30 30 30
	ERROR String (Echo)	ERROR0	45 62 62 5F 62 30

3.7 Error display

On two channel volume counters it is possible to monitor the correct pulse sequence on the channels. Faulty pulses are not counted and thus do not change the volume measurement.
If an error is established by the AS8, the character sequence "**FAUL**" appears in the display.

The error display can also be completely isolated. This is carried out under the menu reference "**08**" at the **"Error display"** position. The error display is enabled with a **"0"** and blocked with a **"1"** (see **4.1 Overview of the input values**).

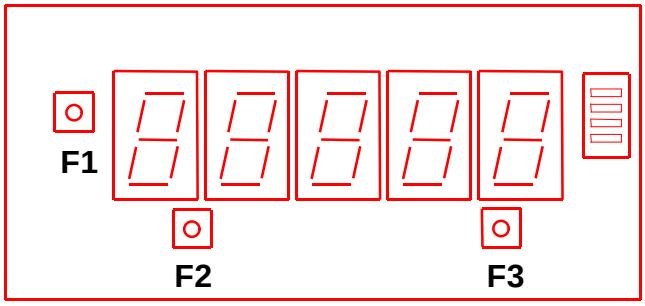
4. AS8 programming

Each time the AS8 is to be operated, it is necessary to adapt the unit to the volume counter that is connected.

Input procedure:

The input procedure is the same for all input values and is therefore described once only.

Programming is carried out by means of three keys which are accessible on removing the front cover. With the keyboard **version /F** the configuration can be made with keys on front panel.The positions of these three keys is shown below.



DIP- Switches

Start input operation

“F1“ is depressed for approx. four seconds to start the input operation.
The first three segments are switched dark, segments four and five display the menu reference number **”00“**. Release **“F1“.**

Change menu reference

By briefly pressing **“F1“** the menu reference numbers **“00” to “08”** can be displayed in sequence.
An input value is concealed behind each menu reference number.
To display the input value, press **“F3”** briefly. A four digit input value appears.
Change input value

The point marks the digit which can be changed by actuating **“F3”**.
The point can be moved by actuating **“F2“.**
After setting the numerical values the point must be placed at the correct position.
On actuating **“F1”**, the display reverts to the menu-reference level. The menu reference **“00”** is displayed again.

Stop input value

To exit the input operation, depress **“F1”** again for approx. four seconds.

4.1 Overview of the input values

The values which are required to be set can be inserted in the column labelled “Input value-User”.

Menu - Reference	Standard setting	Input value - User	Function
00	0.040		Pulse volume of volume counter
01	4.000		Maximum value Analogue output
02	0001.		Damping Digital filter
03	9999.		“Pull-in” value Relay 1
04	9999.		“Drop-out” value Relay 1
05	9999.		“Pull-in” value Relay 2
06	9999.		“Drop-out” value Relay 2
07	0000		Display : **0** = Flow rate / **1** = Volume Analogue output: **0** = Flow rate / **1** = Volume Relay 1 : **0** = Flow rate / **1** = Volume Relay 2 : **0** = Flow rate / **1** = Volume
08	0000		Counter input : **0** = 2-channels / **1** = 1 channel Error display : **0** = Activated / **1** = Blocked Analogue output : **0** = Bipolar / **1** = Unipolar Analogue output : **0** = 0-20mA / **1** = 4-20 mA

If the on and off values for the relays are set at 9999. , then the relays are isolated.

4.2 What must be programmed when connecting a volume counter?

The AS8 Microcontroller is set-up for the connected volume counter.
This is carried out under menu reference **“00 - pulse volume volume counter”** and under menu reference **“08”** at the position **“counter input”**.

The pulse volumes for KRACHT Volume counters can be obtained from the Table.

The **“X”** characters in the “Input value Menu reference 08“ column are of no significance in setting the volume counter.

Designation	Material	Input value Menu reference 00	Input value Menu reference 08
VC 0,025	Sp. Gr./ Iron*	0,025 cm^3	XXX0 2 channels
VC 0,04	Sp. Gr./ Iron	0.040 cm^3	XXX0 2 channels
VC 0,2	Sp. Gr./ Iron	0.245 cm^3	XXX0 2 channels
VC 1	Sp. Gr./ Iron	1.036 cm^3	XXX0 2 channels
VC 3	Sp. Gr./ Iron	3.000 cm^3	XXX0 2 channels
VC 5	Sp. Gr./ Iron	5.222 cm^3	XXX0 2 channels
VC 10	Sp. Gr./ Iron	10.48 cm^3	XXX0 2 channels
VCA0,2VCN0,2	Aluminium	0.200 cm^3	XXX1 1 channel
VCA 2	Aluminium	2.000 cm3	XXX1 1 channel
VC 0,2 .JR	High grd. St.*	0.200 cm^3 (old)	XXX0 2 channels
VC 1 .JR	High grd. St.	1.000 cm3 (old)	XXX0 2 channels
VC 5 .JR	High grd. St.	5.000 cm3 (old)	XXX0 2 channels
VCL 0,1 PA(B)	High grd. St.	0.100 cm3 (old)	XXX0 2 channels

* Sp. Gr. Iron = Spheroidal graphite iron * High grd. St. = High grade steel

Example:

A VC0.04 volume counter is connected. The pulse volume is 0.040 cm^3. The VC 0.04 Volume counter has a 2 channel layout.

- The value 0.040 is entered under menu reference “00“.
- A “0” is entered under menu reference “08” at the position designated “counter input”.

4.3 Which display parameters can be represented (DIP switches) ?

The physical parameters “l/h“, “l/m“, “l/s“ and “Usgal/h“, “Usgal/m“, “Usgal/s“ can be set as display units. Switching between the display parameters is achieved using the DIP switches. The DIP switches are located behind the front cover.

Setting the volume:

SW 1	Function	Factory setting
OFF	Indication in LITRES	X
ON	Indication in USGAL	

Setting the time base:

SW 2	SW 3	Function	Factory setting
OFF	OFF	Minutes	X
OFF	ON	Minutes	
ON	OFF	Hours	
ON	ON	Seconds	

In principle, parameters such as *Millilitres, Grams, Millimeters, Meters and Kilograms can also be displayed.* These can be set via the pulse volume.

Example: *Volume counter connection VC1*

Unit	Pulse factor Volume counter	Conversion factor	Density medium	Pulse volume Menu reference 00

Millilitres	1.036	x	1000	x 1.000	=	1036
Grams	1.036	x	1000	x 1.230	=	1274
Kilograms	1.036	x	1	x 1.230	=	1.274

Units of length are converted in the same way.
Example: Measurement of the speed or position of a cylinder.
VC1mounted on the piston.

Piston diameter = 10 cm => **A** = 10 cm x 10 cm x PI/ 4 = **78.54 cm^2**

$$\text{Factor for each pulse} = \frac{\text{Factor VC}}{\text{Area } \mathbf{A}} = \frac{1.036\ \text{cm}^3}{78.54\ \text{cm}^2} = 0.01319\ \text{cm} = \mathbf{0.1319\ mm}$$

Unit	Factor for each pulse	Conversion factor	pulse volume Menu reference 00
Millimetres	0.1319	x 1000	= 131.9
Metres	0.1319	x 1	= 0.132

4.4 How is the display set ?

The display can be set for flow rate measurement or volume measurement.

Flow rate measurement

A **“0”** is entered at the position designated **“Display”** under the menu reference **“07”** (see **4.1 Overview of the input values**).

Filter function

The measuring principle applied to the AS8 is that of ‘period of oscillation’. When the flow rate is subject to severe fluctuation, the digital filter provides a smoothing effect to steady the indication.
A digital filter can be activated under the menu reference **“02”**..
The higher the input value the greater the filter effect.

Programmed value	0000:	no filter effect
Programmed value	9999:	maximum filter effect

Volume measurement

A **“1”** is entered at the position designated **“Display”**, under the menu reference **“07”** (see **4.1 Overview of the input values**).
The pulses of the volume counter are counted, converted using the pulse volume and displayed.

4.5 What must be programmed when connecting the relay outputs ?

The relay function is selectable. A relay can be allocated to flow rate or volume measurement.

Flow rate measurement

A **“0”** is inserted under the menu reference **“07”**. This takes place at the position designated **“Relay 1”** or **“Relay 2”** (see **4.1 Overview of the input values**).

Volumetric measurement

A **“1”** is inserted under the menu reference **“07”**. This takes place at the position designated **“Relay 1”** or **“Relay 2”** (see **4.1 Overview of the input values**).

Switch functions

For Relay 1, programming takes place under the menu references **“03”** and **“04”**, for Relay 2 under the menu references **“05”** and **“06”** (see **4.1 Overview of the input values**).

The following switch functions can be obtained::

Normally-open function

On reaching the switch-on value the contact is closed.

Example:	Switch-on value (pull-in):	2,500
	Switch-off value (drop-out):	9999

The relay contact is switched when the switch-on value is exceeded. The switch-off value of **9999** has the consequence, that only the switch-on value is evaluated. The relay is not disconnected when the switch-off value is reached.

Normally-closed function

On reaching the switch-off value the contact is opened.

Example:	Switch-on value:	0.000
	Switch-off value:	3,000

The relay contact is switched so long as the switch-off value is not reached. The switch-on value of **0.000** has the consequence, that only the switch-off value is evaluated. The relay is not switched-off if the switch-on value is reached.

Window function

Example:	Switch-on value:	2,500
	Switch-off value:	3,000

The relay contact is switched when the switch-on value is reached. If the switch-off value is exceeded, the relay opens again.

4.6 What must be programmed when connecting the analogue output ?

The function of the analogue output is selectable. The analogue output can be assigned to flow rate or volume measurement.

Flow rate measurement

A **“0”** is entered under menu reference **“7”**. This takes place at the position designated **“Analogue output”** (see **4.1 Overview of the input values).**

Volume measurement

A **“1”** is entered under menu reference **“7”**. This takes place at the position designated **“Analogue output”** (see **4.1 Overview of the input values).**

Signal selection

Menu reference 08	Analogue output

00XX	+/- 20 mA or +/- 10 Volt
01XX	0 - 20 mA or 0 - 10 Volt
10XX	+/- 20 mA or +/- 10 Volt
11XX	4 - 20 mA or 2 - 10 Volt

The digits identified with an **“X”** in the Menu reference **“08”** column are of no significance to the setting procedure.

The maximum value is entered under the menu reference **“01”**, maximum analogue output, corresponding to an output of 10 V or 20 mA.

Example:
Maximum analogue output value: 4,000 [Litres / minute]

The flow rate is 4,000 Litres/minute, so 10 Volt or 20 mA are output. If the flow rate is 0,000 Litres/minute, then 0 Volt or 0 mA is output.

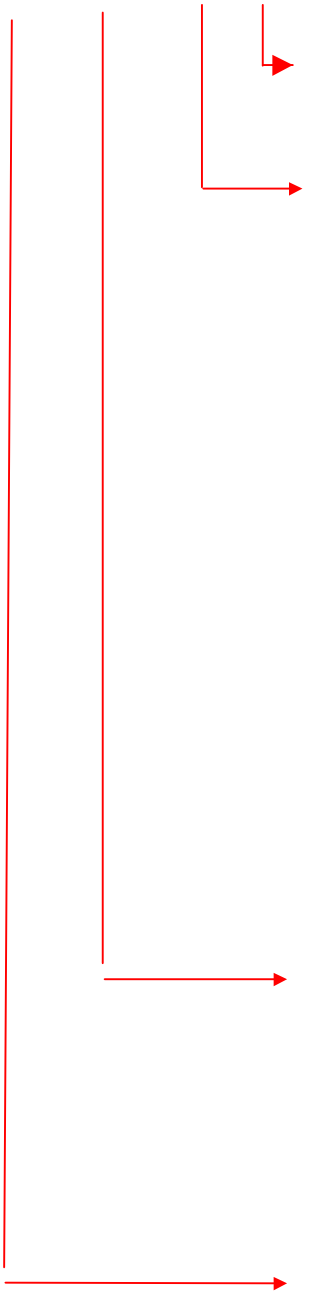
5. Technical Data

Processor	PIC 17C42
Power pack	
Supply	230 V AC, +6% ... -10% / 50-60 Hz, optional 115 V AC
Power consumption	ca. 3.5 W
Sensor supply	24 V DC +/- 20%, 50 mA
General data	
Display	Principle : 7 Segment LED, 13.2 mm, red Display :0.000 ... 9999 with floating point overrun (>9999) : display 9999 overrun (<-9999) : display -9999 Status indication : LED K1 and K2 for relays 1 and 2
Control keys	Three keys behind the front cover, optional: keys on front panel
Housing	Control panel housing in plastic
Front frame	96x48 mm, DIN 43700
Installed depth	ca. 122 mm with terminal strip
Panel cut-out	92x45 mm, Tol +0.8 x +0.6 mm
Protection class (DIN 40050)	IP 54 with appropriate control panel installation
Weight	ca. 0.4 kg
Connections	15 pole screw terminal strip
Relay contacts	each 1 N.O., 24 Volt / 1 A, typ. operating time 6 ms
Digital inputs	
Input impedance	>= 7500 Ohm
Input amplitude	low <= 9 Volt, high >= 12 Volt
Operating time	typ. 1 ms
Analogue outputs	Set as voltage or current output via jumpers
Voltage output	+/- 10 Volt, 0 - 10 Volt, 2 - 10 Volt / load >= 1 kOhm, Resolution 10 bit, short-circuit proof
Current output	+/- 20 mA, 0 - 20 mA, 4 - 20 mA / load <= 250 Ohm, Resolution 10 bit, short-circuit proof
Volume counter inputs	
Input impedance	>= 7500 Ohm
Input amplitude	low <= 9 Volt, high >=12 Volt
Measuring principle, flow rate	Period of oscillation measurement (rising edge)
Maximum input frequency	1Hz ... 2500 Hz
Measuring range, totalisator	2 x 10^9 pulses
Serial interfaces	Screened data cable recommended
RS 232	Cable length <= 15 m
Input voltage	max. +/-30 V
Input current	typ. +/- 3 mA at +/- 9 V input voltage
Output current	typ. +/- 3 mA
Setting	9600 baud, 8 bit, no parity, 1 stop bit
Cable	Screened data cable recommended
Ambient conditions	
Operating temperature	0 C to + 60 °C
Storage temperature	-25 °C to +85 °C

6. Type code

Example :

AS8 - U - 230 / .../ ....



F keys on front panel

Identification for special programs

DOS	Dosing
ZM	Cylinder stroke measurement
RP	Flow control loop
PUR	Ratio control loop
V2F	Flow rate and ratio measurement
V2C	Volume ratio measurement
A2F	Sum measurement
D2F	Difference measurement
FM20	Flow rate measurement switchable for all KRACHT volume counters
Without - specification	Standard Flow rate or volumetricmeasurement

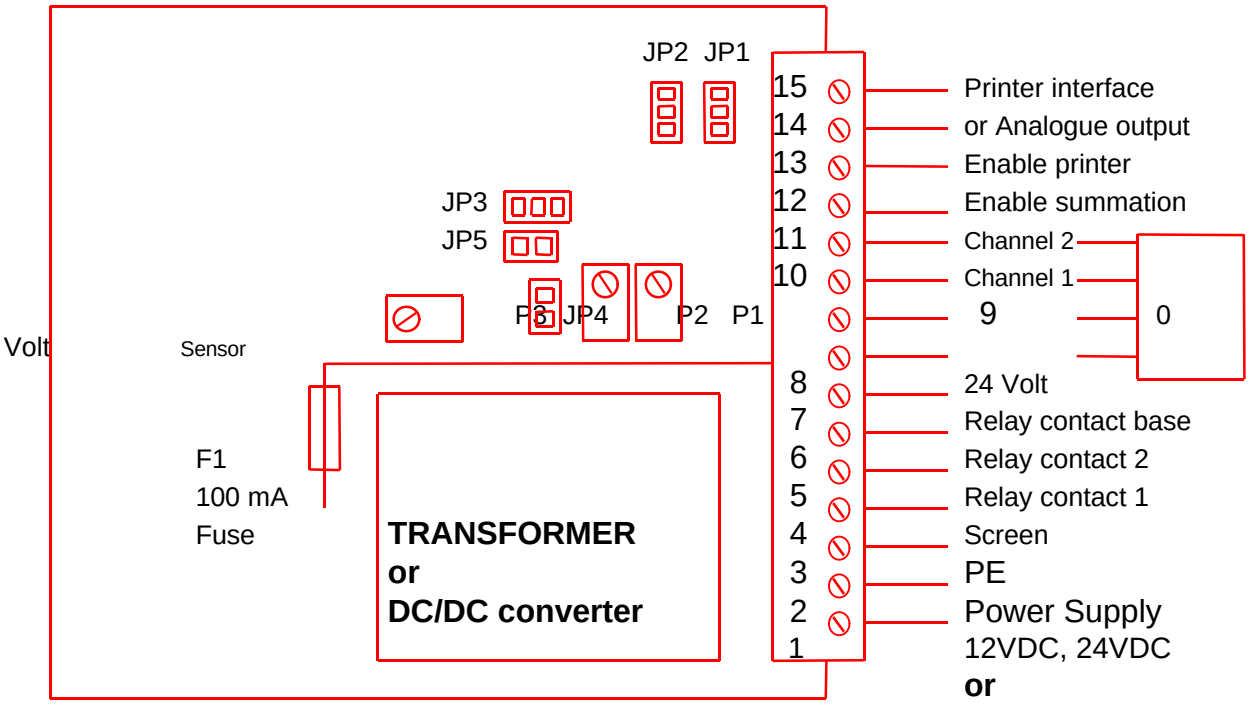
230	230 VAC 50/60 Hz
120	120 VAC 50/60 Hz
12	12 VDC
24	24 VDC

U	Voltage output +/- 10 Volt
I	Current output +/- 20 mA
RS	Serial interface RS232

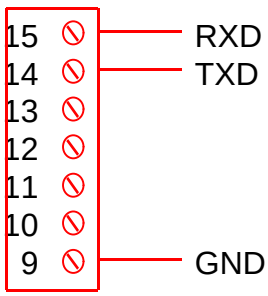
7. Connections

The electrical connections are made on plugable screw terminals.

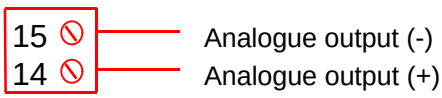
Stranded connections on the basis of the prevention of accidental contact in accordance with VDE 0411 Part 100 only by means of connector sleeves with insulating material caps. Non-factory wired connections should not be otherwise connected.
It is recommended that all signal connection leads are screened and the screening earthed on both sides, in order to avoid HF interference. The signal connection leads should not be combined in the same cable assembly as mains cables, motor cables, etc.



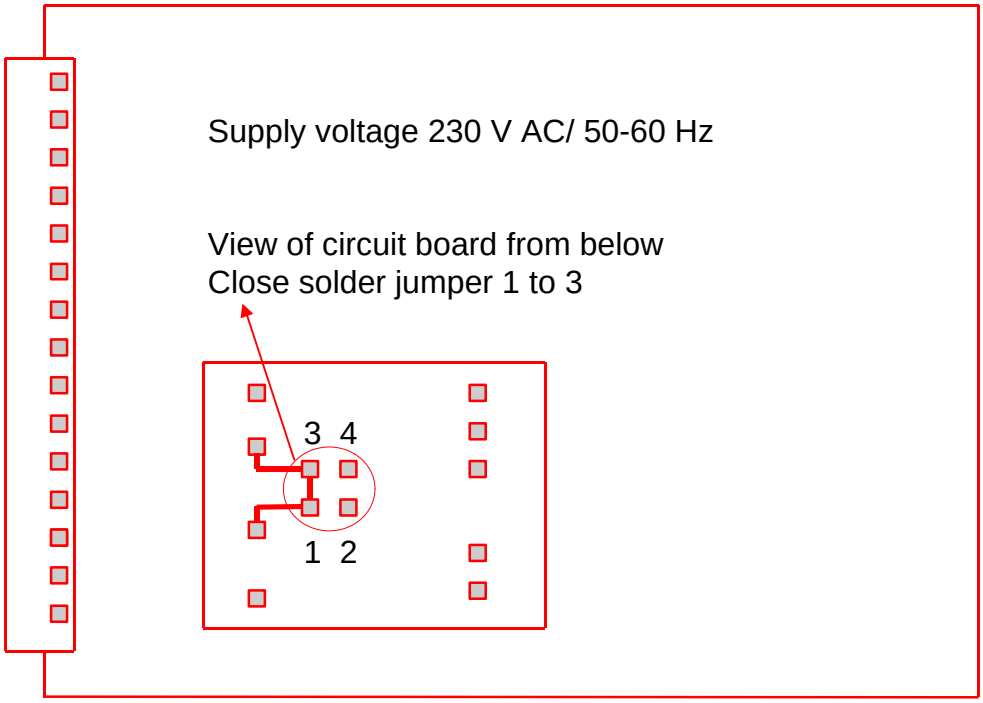
Printer interface

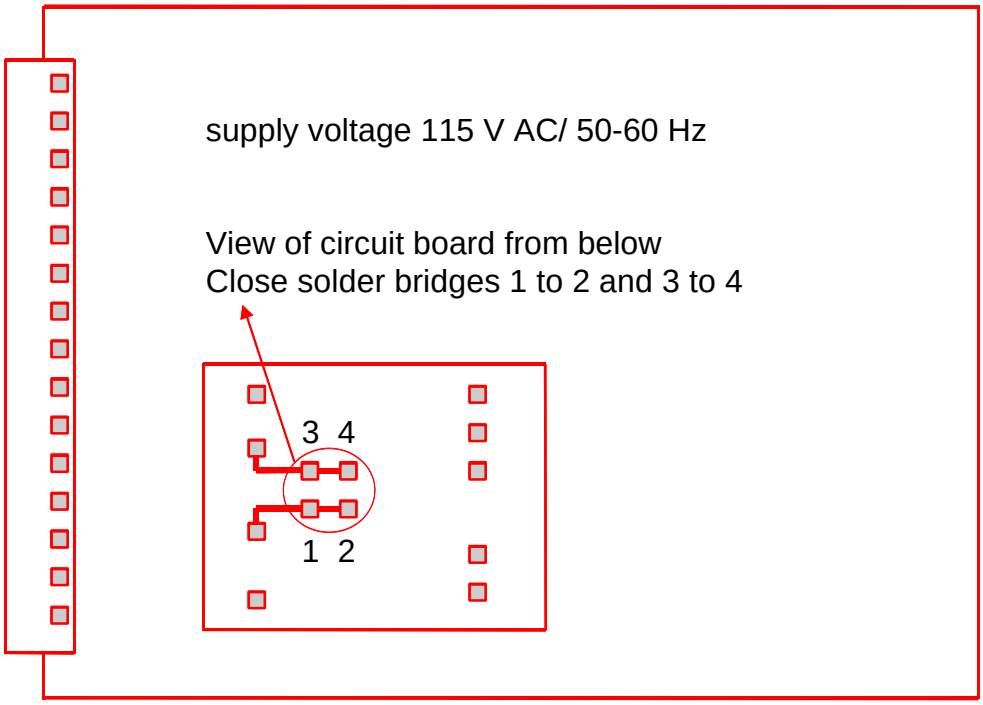


Analogue output

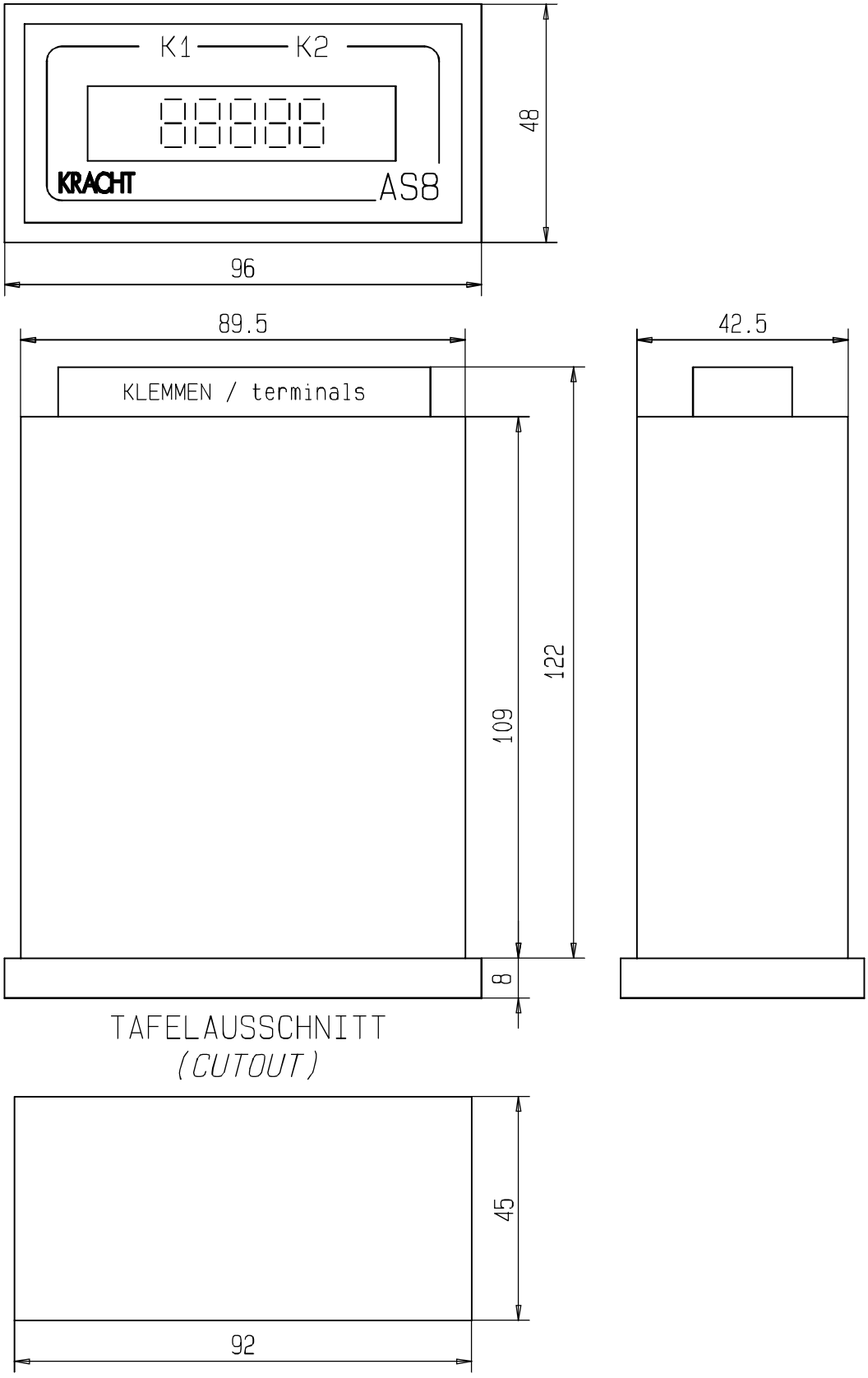


8. Setting the supply voltage





9. Dimensions



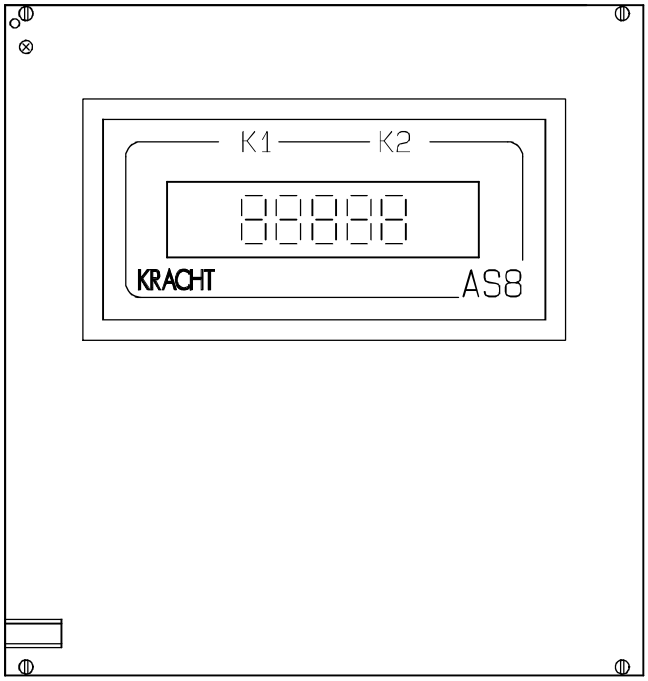
10. AS8 as 19“ Rack Unit

The AS8 is built into a 3HE 25TE 19” front plate. All the connections for the AS8 are wired on a Eurocard and are available on a 32 pin contact strip for further connection.

AS8 wiring on the contact strip:

Contact PIN		AS8 terminal	
ac2	→	8	24 Volt sensor supply
ac4	→	10	Channel 1
ac6	→	11	Channel 2
ac8	→	12	Enable summation
ac10	→	13	Enable printer
ac12	→	14	TXD / Analogue output (+)
ac14	→	15	RXD / Analogue output (-)
ac16	→	5	Relay contact 1
ac18	→	6	Relay contact 2
ac20			
ac22	→	2	N
ac24	→	1	L
ac26	→	3	PE
ac28			
ac30	→	7	Relay contact base
ac32	→	9	0 Volt

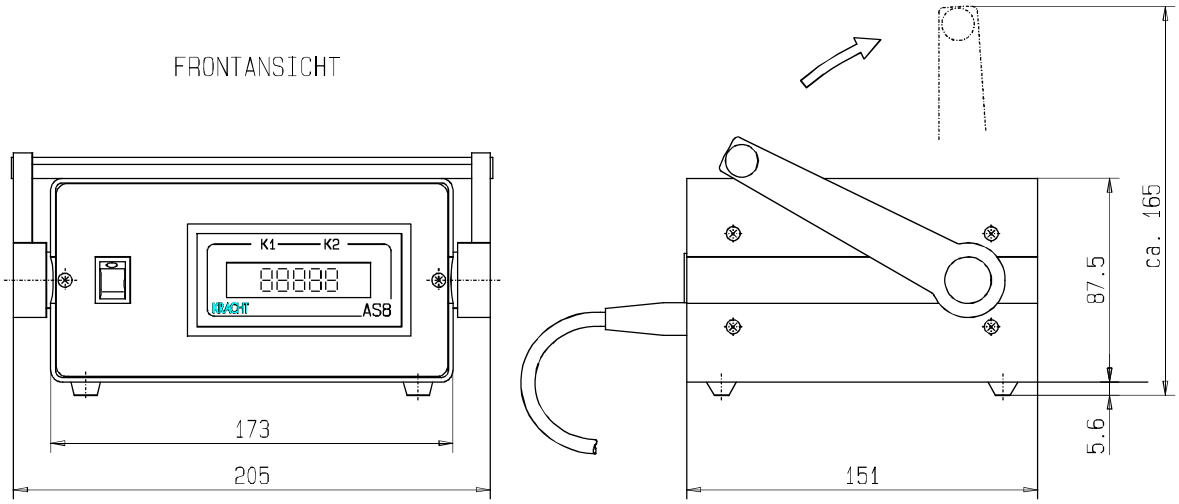
View:



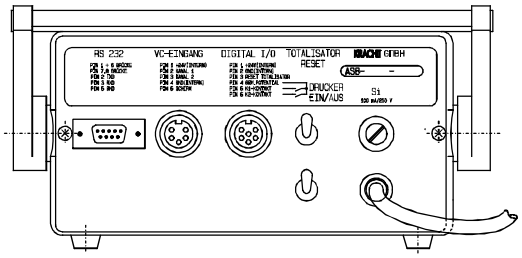
11. AS8 in the Desk-top Housing

The desk-top housing is available with analogue output or serial interface.

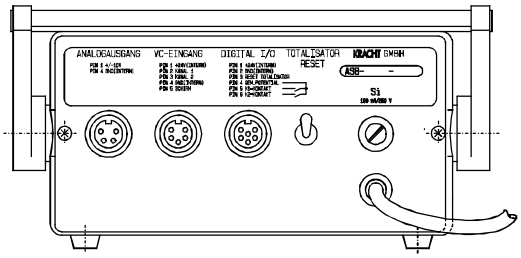
View:



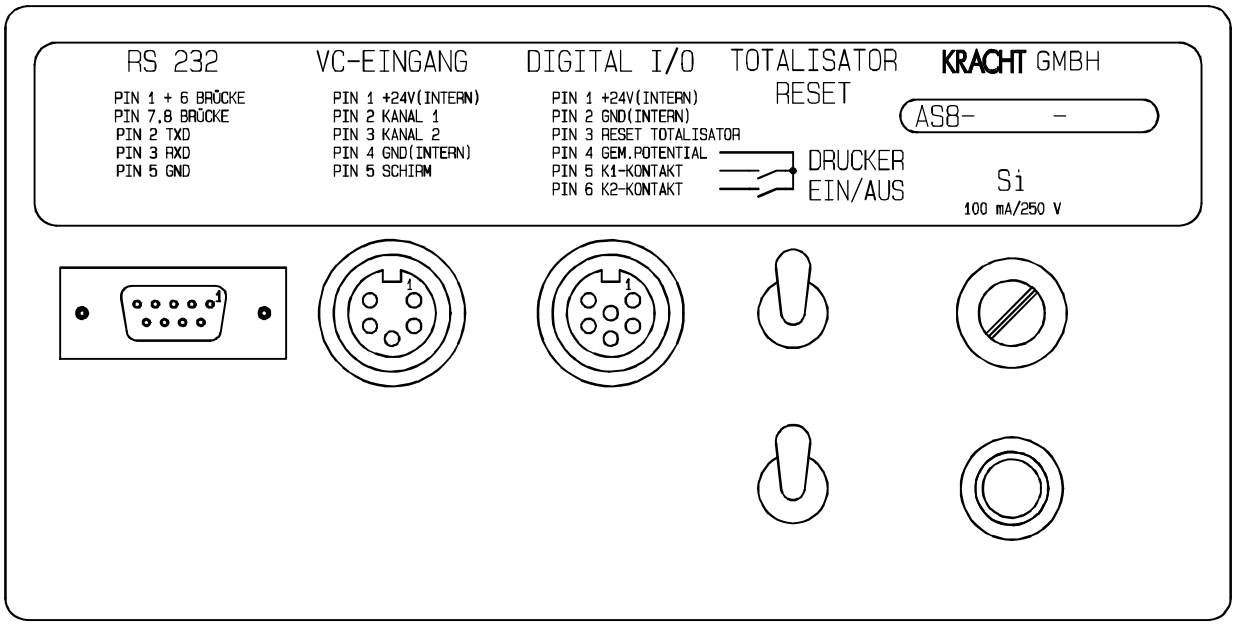
RÜCKANSICHT MIT RS 232



RÜCKANSICHT MIT ANALOGAUSGANG



Connections with RS232 serial interface:



Connections with analogue output: